

What is claimed is

1           1. A fluorescent lamp comprising:

2           a fluorescent tube that is composed of a glass tube having  
3           a phosphor layer formed on an inner surface thereof and mercury  
4           and a rare gas enclosed therein; and

5           electrodes that cause an electrical discharge within  
6           the fluorescent tube,

7           wherein the glass tube is made of a glass material that  
8           contains an emissive element, the emissive element emitting,  
9           when exposed to first ultraviolet light that is emitted due  
10          to mercury excitation, second ultraviolet light that has a  
11          longer wavelength than the first ultraviolet light.

1           2. The fluorescent lamp of Claim 1,

2           wherein the emissive element emits visible light  
3           together with the second ultraviolet light, when exposed to  
4           the first ultraviolet light.

1           3. The fluorescent lamp of Claim 1,

2           wherein an entire luminous flux emitted from the  
3           fluorescent lamp includes:

4           a first luminous flux that is formed by visible light  
5           emitted from the phosphor layer when exposed to the first  
6           ultraviolet light;

7 a second luminous flux that is formed by visible light  
8 emitted from the emissive element when exposed to the first  
9 ultraviolet light; and

10 a third luminous flux that is formed by visible light  
11 emitted from the phosphor layer when exposed to the second  
12 ultraviolet light,

13 wherein the second luminous flux and the third luminous  
14 flux together constitute at least 2% of the entire luminous  
15 flux emitted from the fluorescent lamp.

1 4. The fluorescent lamp of Claim 1,  
2 wherein a thickness of the glass tube is 0.62mm or less.

1 5. The fluorescent lamp of Claim 1,  
2 wherein a thickness of the phosphor layer is below 20  
3  $\mu\text{m}$ .

1 6. A fluorescent lamp comprising:  
2 a fluorescent tube that is composed of a glass tube having  
3 a phosphor layer formed on an inner surface thereof and mercury  
4 and a rare gas enclosed therein; and

5 electrodes that cause an electrical discharge within  
6 the fluorescent tube,

7 wherein the glass tube is made of a glass material  
8 containing an oxide of at least one element selected from

9 the group consisting of titanium, zirconium, vanadium,  
10 niobium, tantalum, molybdenum, tungsten, thallium, stannum,  
11 plumbum, bismuth, lanthanum, cerium, praseodymium, neodymium,  
12 samarium, europium, gadolinium, terbium, dysprosium, holmium,  
13 erbium, thulium, ytterbium, and lutetium.

1 7. The fluorescent lamp of Claim 6, wherein  
2 the glass material contains 0.01wt% to 10wt% of an oxide  
3 of at least one element selected from the group consisting  
4 of titanium, zirconium, vanadium, niobium, tantalum,  
5 molybdenum, tungsten, lanthanum, cerium, praseodymium,  
6 neodymium, samarium, europium, gadolinium, terbium,  
7 dysprosium, holmium, erbium, thulium, ytterbium, and  
8 lutetium.

1 8. The fluorescent lamp of Claim 6, wherein  
2 the glass material contains 0.01wt% to 0.5wt% of an oxide  
3 of at least one element selected from the group consisting  
4 of thallium, stannum, plumbum, and bismuth.

1 9. A fluorescent lamp comprising:  
2 a fluorescent tube having a protective layer formed on  
3 an inner surface thereof, a phosphor layer formed on the  
4 protective layer, and mercury and a rare gas enclosed therein;

5 and

6 electrodes that cause an electrical discharge within  
7 the fluorescent tube,

8 wherein the protective layer contains an emissive  
9 element, the emissive element emitting, when exposed to first  
10 ultraviolet light that is emitted due to mercury excitation,  
11 second ultraviolet light that has a longer wavelength than  
12 the first ultraviolet light.

1 10. The fluorescent lamp of Claim 9,  
2 wherein the emissive element emits visible light  
3 together with the second ultraviolet light, when exposed to  
4 the first ultraviolet light.

1 11. The fluorescent lamp of Claim 9,  
2 wherein an entire luminous flux emitted from the  
3 fluorescent lamp includes:

4 a first luminous flux that is formed by visible light  
5 emitted from the phosphor layer when exposed to the first  
6 ultraviolet light;

7 a second luminous flux that is formed by visible light  
8 emitted from the emissive element when exposed to the first  
9 ultraviolet light; and

10 a third luminous flux that is formed by visible light  
11 emitted from the phosphor layer when exposed to the second

12 ultraviolet light,  
13 wherein the second luminous flux and the third luminous  
14 flux together constitute at least 2% of the entire luminous  
15 flux emitted from the fluorescent lamp.

1 12. A fluorescent lamp comprising:  
2 a fluorescent tube having a protective layer formed on  
3 an inner surface thereof, a phosphor layer formed on the  
4 protective layer, and mercury and a rare gas enclosed therein;  
5 and  
6 electrodes that cause an electrical discharge within  
7 the fluorescent tube,  
8 wherein the protective layer contains an oxide of at  
9 least one element selected from the group consisting of  
10 titanium, zirconium, vanadium, niobium, tantalum, molybdenum,  
11 tungsten, thallium, stannum, plumbum, bismuth, lanthanum,  
12 cerium, praseodymium, neodymium, samarium, europium,  
13 gadolinium, terbium, dysprosium, holmium, erbium, thulium,  
14 ytterbium, and lutetium.

1 13. The fluorescent lamp of Claim 12, wherein  
2 the protective layer contains 0.01wt% to 10wt% of an  
3 oxide of at least one element selected from the group  
4 consisting of titanium, zirconium, vanadium, niobium,  
5 tantalum, molybdenum, tungsten, lanthanum, cerium,

6 praseodymium, neodymium, samarium, europium, gadolinium,  
7 terbium, dysprosium, holmium, erbium, thulium, ytterbium,  
8 and lutetium.

1 14. The fluorescent lamp of Claim 12, wherein  
2 the protective layer contains 0.01wt% to 0.5wt% of an  
3 oxide of at least one element selected from the group consisting  
4 of thallium, stannum, plumbum, and bismuth.

1 15. A high intensity discharge lamp comprising:  
2 an arc tube in which an emissive material is enclosed,  
3 the emissive material emitting visible light and ultraviolet  
4 light when excited by an electric discharge; and  
5 an envelop whose one surface surrounding the arc tube  
6 is covered with a phosphor layer,  
7 wherein the envelop is made of a glass material that  
8 contains an emissive element, the emissive element emitting,  
9 when exposed to first ultraviolet light that is emitted due  
10 to excitation of the emissive material by the electric  
11 discharge, second ultraviolet light that has a longer  
12 wavelength than the first ultraviolet light.

1 16. The high intensity discharge lamp of Claim 15,  
2 wherein the emissive element emits visible light  
3 together with the second ultraviolet light when exposed to

4 the first ultraviolet light.

1 17. The high intensity discharge lamp of Claim 15,  
2 wherein an entire luminous flux emitted from the high  
3 intensity discharge lamp includes:

4 a first luminous flux that is formed by the visible light  
5 emitted due to the excitation of the emissive material by  
6 the electric discharge;

7 a second luminous flux that is formed by visible light  
8 emitted from the emissive element when exposed to the first  
9 ultraviolet light; and

10 a third luminous flux that is formed by visible light  
11 emitted from the phosphor layer when exposed to the second  
12 ultraviolet light.

1 18. A high intensity discharge lamp comprising:

2 an arc tube in which an emissive material is enclosed,  
3 the emissive material emitting visible light and ultraviolet  
4 light when excited by an electric discharge; and

5 an envelop whose one surface surrounding the arc tube  
6 is covered with a phosphor layer,

7 wherein the envelop is made of a glass material that  
8 contains an oxide of at least one element selected from the  
9 group consisting of titanium, zirconium, vanadium, niobium,  
10 tantalum, molybdenum, tungsten, thallium, stannum, plumbum,

11 bismuth, lanthanum, cerium, praseodymium, neodymium,  
12 samarium, europium, gadolinium, terbium, dysprosium, holmium,  
13 erbium, thulium, ytterbium, and lutetium.

1 19. A high intensity discharge lamp comprising:  
2 an arc tube in which an emissive material is enclosed,  
3 the emissive material emitting visible light and ultraviolet  
4 light when excited by an electric discharge; and  
5 an envelop that is provided so as to envelop the arc  
6 tube,  
7 wherein the envelop is made of a glass material that  
8 contains an emissive element, the emissive element emitting  
9 visible light, when exposed to ultraviolet light that is  
10 emitted due to excitation of the emissive material by the  
11 electric discharge.

1 20. The high intensity discharge lamp of Claim 19,  
2 wherein an entire luminous flux emitted from the high  
3 intensity discharge lamp includes:  
4 a first luminous flux that is formed by the visible light  
5 emitted due to the excitation of the emissive material by  
6 the electric discharge; and  
7 a second luminous flux that is formed by visible light  
8 emitted from the emissive element when exposed to the  
9 ultraviolet light that is emitted due to the excitation of



10 the emissive material by the electric discharge.

1 21. A high intensity discharge lamp comprising:

2 an arc tube in which an emissive material is enclosed,  
3 the emissive material emitting visible light and ultraviolet  
4 light when excited by an electric discharge; and

5 an envelop that is provided so as to envelop the arc  
6 tube,

7 wherein the envelop is made of a glass material that  
8 contains an oxide of at least one element selected from the  
9 group consisting of titanium, zirconium, vanadium, niobium,  
10 tantalum, molybdenum, tungsten, thallium, stannum, plumbum,  
11 bismuth, lanthanum, cerium, praseodymium, neodymium,  
12 samarium, europium, gadolinium, terbium, dysprosium, holmium,  
13 erbium, thulium, ytterbium, and lutetium.

1 22. An incandescent lamp comprising:

2 a tube being made of a base material that is one of glass  
3 and quartz, in which at least one of a rare gas, an inert  
4 gas, and tungsten halide is enclosed as an emissive material;

5 electrodes being made of a lead-in wire and a tungsten  
6 filament,

7 wherein the base material contains an emissive element,  
8 the emissive element emitting visible light when exposed to  
9 ultraviolet light that is emitted due to excitation of the

